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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Improved cleaning wand.**

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CH-A- 252 109
US-A-2 304 961
US-A-4 135 272

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Description

Background of the Invention

This invention relates to an improved cleaning wand including a head removably attachable to a handle, for cleaning lavatory facilities.

The cleaning of lavatory facilities, such as toilet bowls and urinals, often requires the utilization of a cleaning device or wand. A cleaning wand typically comprises a handle having a brush or cleaning head on one end thereof. Further, the brush or head is typically permanently attached to the handle, thereby requiring disposal of the entire device when the head or brush becomes worn or otherwise unusable. If the cleaning head is not securely attached to the handle it may tend to loosen and or fall during the cleaning process. Finally, the device typically accommodates only a single type of cleaning element.

Prior attempts to alleviate the problems associated with lavatory cleaning devices are shown in U.S. Patent No. 4,417,364 issued to Hammond, U.S. Patent No. 4,377,879 issued to Christo, and U.S. Patent No. 4,135,272 issued to Stephenson. U.S. Patent No. 4,377,879 discloses a cleaning head or connector which is permanently connected to a handle. U.S. Patent Nos. 4,417,364 and 4,135,272 disclose a cleaning connector or head in threaded engagement with the handle. Removal of the connector or head thus requires the cumbersome rotation of the handle and/or rotation of the connector or head. If the brush or yarn has any cleaning solution thereon and the connector is rotated, the acidic solution may easily spin off onto the user's face or clothing.

In addition to the above described limitation, none of the devices disclosed in the aforementioned patents permit the removal of the yarn or other cleaning elements from the head or connector without the removal of the strap which connects the cleaning elements directly to the head. Furthermore, all of the devices described in the referenced patents are limited to the utilisation of a single cleaning element, namely, a plurality of threads of pieces of yarn.

US—A—2 304 961 discloses a cleaning device in accordance with the prior art portion of claim 1. This device utilises a threaded connection between the handle and the head providing the same difficulties arising from cumbersome rotation of the head relative to the handle for demounting and mounting thereof which is disadvantageous in the other prior art documents referred to above. The present invention, as characterised in claim 1, provides a simple and reliable means by which the head of the cleaning wand is readily securable to the handle without any rotation and under the simple control of a single collar axially movable on the upper end of the head within which is received the one end of the handle.

The cleaning head as later described in detail includes a hollow sleeve adapted to receive the cleaning wand handle and a base adapted to receive the cleaning element retainer. The sleeve receives the lower end of the handle and is secured via detents that cooperate with the radial groove in th handle. The h ad is locked in position by the collar or ferrule that slides axially on the outer surface of the sleeve and engages a raised radial rib on the end of the sleeve, thereby providing a detented lock by cooperating with an internal groove or depression on the inner surface of the collar. Sliding the collar away from the handle readily releases the head for disengagement from the handle.

The swab, fiber bundle, or other cleaning element is secured to a cleaning element retainer by means of a flexible strap. The retainer is adapted to permit securement of the strap thereto and is further provided with a plurality of barbs. The barbs cooperate with a pair of slots in the head to permit a detachable snap fit between the swab retainer and head. An alternate or second cleaning element is also attached to the head. The swab and/or head may be readily disposed of after use.

The present invention thus overcomes the limitations inherent in prior devices by providing a cleaning head which can be securely attached to the handle and readily removed without rotation and without contacting the soiled cleaning element. Further, the present invention permits the removal of the cleaning element from the head and/or wand without the necessity of removing the strap and/or head. Finally, the present invention provides a multifunction cleaning head which encompasses a plurality of cleaning elements and/or cleaning surfaces.

Brief Description of the Drawings

FIG. 1 is an exploded perspective view of a preferred embodiment of an improved cleaning wand.

FIG. 2A—2E is a sequential, cross-sectional view illustrating assembly of a preferred embodiment of an improved cleaning wand.

FIG. 3 is an assembled perspective view of a preferred embodiment of an improved cleaning wand.

FIG. 4 is a cross-sectional view taken along section lines 4—4 of FIG. 3 illustrating the connection of a preferred embodiment of a cleaning head to a cleaning wand handle.

FIG. 5A—5C is a sequential view illustrating assembly of a cleaning element and connection thereto to a cleaning element-retainer.

Detailed Description of the Preferred Embodiment

Referring to FIG. 1, a preferred embodiment of an improved cleaning wand is identified by the number 10. The wand includes a handle 2 having a rearward end 14 and a forward end 16. In the embodiment illustrated, a cleaning fluid cartridge and pump mechanism may be located in the rearward end 14 of handle 12 with the cleaning fluid urged outward through the forward end 16 by means of a trigger 18. It is to be understood, however, that any type of handle may be utilized having a forward end 16, as hereinafter described.

Referring again to FIG. 1, the forward end 16 of handle 12 is provided with a raised, integral boss or key 22 and an annular, radial groove or depression 24. Forward end 16 is also provided with an annular, raised lip 26 and a plurality of bosses 28 intermediate groove 24 and lip 26. Cleaning wand 10 is also provided with a collar or ferrule 32 having a hollow passage 34 therethrough. The inner diameter of collar 32 is provided with an annular groove or depression 36 on the rearward end thereof and collar 32 has a plurality of shoulders 38 located at spaced intervals about the rearward end thereof. Finally, the internal diameter of collar 32 is provided with a plurality of raised ribs 40 which extend the length of passage 34.

Referring again to FIG. 1, the improved cleaning wand 10 is further provided with a cleaning head or holder 42 having a sleeve 44 on the rearward end thereof and a spherical, concave base 46 integral therewith on the forward end thereof. Sleeve 44 has a hollow passage 48 therethrough and a plurality of grooves or slots 50 on the rearward end thereof. As explained in greater detail hereinbelow, individual groove 50a is larger than the remainder of the grooves 50 and is adapted to receive key 22 therein. On the rearward end of sleeve 44, the internal diameter is provided with a plurality of lips or detents 51 intermediate grooves 50 and the external diameter is provided with a plurality of shoulders or raised radial ribs 53 intermediate grooves 50. Head 42 is further provided with a raised, radial boss 52 which extends axially along the sleeve 44 from the base 46 to approximately midpoint on the sleeve 44. Boss 52 is further provided with a discharge orifice 54 for discharging cleaning fluid from handle 12, as previously described, or draining fluid from head 42, and an alignment indicator 56. Boss 52 provides recessed protection of the cleaning fluid spray tip (not shown) to prevent clogging and/or damage during use. Finally, head 42 is provided with a first barb groove 58 in base 46 and a second barb groove 60 in the forward end of sleeve 44.

Still referring to FIG. 1, the improved cleaning wand 10 is provided with a cleaning element connector or retainer 62 having a singular integral barb 64 on one end thereof and a pair of integral barbs 66 on the opposite end thereof. Retainer 62 is preferably constructed of injection molded plastic. Retainer 62 has a concave, uppermost surface 68 having a slot 70 and a slot 72 therethrough. Retainer 62 has a base 63 and is provided with a plurality of retainer ribs 86 and 88 on the underside thereof within base 63.

Improved cleaning wand 10 is also provided with a first cleaning element 74 and a second cleaning element 76. Improved cleaning wand 10 is further provided with a flexible strap 78 for attaching cleaning element 74 to retainer 62, as hereinafter described. Strap 78 is provided with a T-shaped end 80, a handle grip 82, and a pair of spherical projections 84 integral with strap 78 and located near hand grip 82.

Referring to FIGS. 2A—2E and 5A—5C, the assemblag of the improved cleaning wand 10 is shown in greater detail. Integral T-shaped end 80 of strap 78 is inserted into slot 72 and rotated 90° to facilitate an int rferenc fit b tw en retainer ribs 86 which are integrally molded within retainer 62, as illustrated in FIG 2A. The first cleaning element 74 illustrated in FIG. 5A, is thereafter placed atop concave surface 68 of retainer 62, as further illustrated in FIG. 2A. Strap 78 is thereafter caused to circumscribe cleaning element 74 by means of integral handle 82, as illustrated in FIG. 2B and FIG. 5B. The flexible strap 78 is drawn through groove 70 until first and second spherical projection 84 forms an interference fit between retainer ribs 88 which are integrally molded within retainer 62, as illustrated in FIG. 2B and FIG. 5C. The remainder of the flexible strap 78 is thereafter cut or otherwise severed, as illustrated in FIG. 5C. and by the dashed lines in FIG. 2B, to facilitate clearance within passage 48. It is to be understood that the location of spherical projection 84 on strap 78 is critical to the tension applied to cleaning element bundle 74. Further, strap 78 in combination with retainer 62 located in approximately the center of bundle 74 transform fiber bundle 74 into a swab 74a.

Referring to FIG. 2C, retainer 62 having cleaning element 74a fixed thereto is removably attached to the spherical, concave interior 90 of base 46 by inserting barb 64 into slot 58. Retainer 62 with swab 74a connected thereto is thereafter rotated upward and into the spherical interior 90, as illustrated by the arrow in FIG. 2C, until barbs 66 snap and lock into slot 60, as illustrated in FIG. 2D. In this position, base 63 of retainer 62 forms a snug fit within the forward end of hollow passage 48 Referring to FIG 2D and FIG. 2E, the second cleaning element 76 is appropriately secured to the spherical, exterior surface of base 46 by a hot melt adhesive, thereby covering barb 66.

Head assembly 42 is connected to handle 12 by inserting forward end 16 into hollow passage 48 of sleeve 44, as illustrated by the arrows in FIG. 2D. It is to be understood that grooves 50 and 50a provide a means of flexing the rearward end of sleeve 44 to overcome the interference established by lips 51. When forward end 16 has been properly inserted into passage 48, key 22 will be received within orientation groove 50a, lips 51 will be received within groove 24 in a snap fit, and shoulders 53 will abut against bosses 28, as illustrated in FIG. 2E. The proper insertion of forward end 16 into sleeve 44 is facilitated by aligning key 22 up with groove 50a and alignment indicator 56 on boss 52. Indicator 56 also identifies the direction of discharge of cleaning fluid from orifice 54.

As further illustrated in FIG. 2E, collar 32 is adapted to slide axially along the length of sleeve 44 with sleeve 44 being received within passage 34. Such axial movement back and forth along the exterior or outer diameter of sleeve 44 is facilitated by ribs 40. The assemblage of the improved

cleaning wand 10 is thus completed, as illustrated in FIG. 3, by sliding collar 32 along the length of sleeve 44, as illustrated by the arrow in FIG. 2E, thereby locking head 42 onto handle 12. As illustrated in FIG. 4, collar shoulder 38 abuts against annular lip 26 and collar groove 36 receives sleeve shoulder 53, thereby providing detachable, locked engagement between head 42 and handle 12. Head 42 may be readily disengaged from handle 12 in the reverse of the engagement process by grasping handle 12 and sliding collar 32 toward base 46, groove 24 overcoming detents 51, and collar 32 abutting against boss 52, thereby resulting in detachment of head 42 from handle 12 without contacting cleaning elements 74 or 76.

In the preferred embodiment, cleaning element 74 comprises approximately seven hundred (700) strands of random polypropylene fiber cut in lengths of approximately 8.9 cms and combined into one bundle, as illustrated in FIG. 5A. As previously described, the bundled fibers 74 are converted into a swab 74a having a moplike shape by strap 78 and retainer 62, thereby providing a real means to clean inside and outside surfaces of toilets and urinals. The concave, interior surface 90 of base 46 assists in the formation and retention of the desired swab shape and provides reinforcement for optimizing the cleaning function of the swab 74a. The combined bundling and forming of the fibers 74 into a puff like swab 74a creates ideal water characteristics. For example, absorbency and saturation is inherent in the fiber and release by shaking is also excellent, again due to the inherent nature of the polypropylene fiber. However, the tightly bundled core created by the strap 78 and retainer 62 working in cooperation with the concave, spherical interior 90 of the head 42 absorbs and retains transient fluid and retards dripping.

Cleaning element 76 is preferably a non-woven fiber pad having cleaning surfaces 76a and 76b, as illustrated in FIG. 1 and FIG. 3. Each of the respective cleaning surfaces of pad 76 provides an aggressive brushlike means of cleaning the flush hole and under the flush ring of a toilet bowl or urinal. It is to be understood that cleaning element 76 will be provided with a proper size and shape to accommodate the design of the toilet bowl or urinal to be cleaned.

The present invention thus provides a disposable multifunction cleaning device including a plurality of cleaning elements and/or cleaning surfaces. The swab 74a and retainer 62 are removably attachable to head 42 and head 42 is removably attachable to handle 12. Further, the head 42 may be readily aligned on and removed from the handle 12 without contacting the potentially soiled cleaning surfaces. Finally, swab 74a has ideal water retention characteristics for optimum cleaning of inner and outer surfaces and excellent non-dripping characteristics when the cleaning process has been concluded.

Claims

1. A cleaning wand comprising: a handle (12); a head (42) having a passage (48) therein for fitting receipt of one end (16) of the handle; means (32, 44) for removably attaching said head to said handle a first cleaning element (74); means (62, 78) for removably attaching said first cleaning element to said head; and a second cleaning element (76) attached to said head (42), characterised in that the means for removably attaching the head (42) to the handle (12) comprises a lip (51) projecting radially inwardly from an internal surface of a rearward end of the passage (48) through the head, a groove (24) in said one end of said handle for resilient mating with said lip; and a collar (32) axially slidable along an external surface of said rearward end of said head, said collar (32) having a groove (36) adapted for resilient mating with a (53) on the external surface at the rearward end of said head, said collar further comprising a shoulder (38) for abutting an annular lip (26) on said handle.

2. A cleaning wand as claimed in claim 1, wherein said means for removably attaching said first cleaning element (74) to said head (42) comprises a flexible strap (78) for attaching said first cleaning element to a retainer (62), said retainer having a first barb (64) for engaging a first slot (58) in said head and a second barb (66) for engaging a second slot (60) in said head.

3. A cleaning wand as claimed in claim 2, wherein said flexible strap (78) has a first T-shaped end (80) received in a first groove (72) in said retainer (62) with an interference fit with first ribs (86) within said retainer; and a second end having a projection (84) thereon to form an interference fit within a second groove (70) between ribs (88) within said retainer.

4. A cleaning wand as claimed in claim 1, 2 or 3, wherein said first cleaning element (74) is a bundle of polypropylene fibres in the shape of a swab and said second cleaning element (76) is a non-woven fibre pad.

5. A cleaning wand as claimed in any preceding claim, wherein said one end of the handle (12) comprises a key (22) received in a slot (50a) extending axially through the wall of said passage (48).

Patentansprüche

1. Reinigungsstab mit einem Handgriff (12), einem Kopf (42) mit einem Durchgang (48) zur Einpassung des einen Endes (16) des Handgriffes, Mittel (32, 44) zur lösbaren Verbindung des Kopfes mit dem Handgriff, einem ersten Reinigungselement (74), Mittel (62, 78) zur lösbaren Verbindung des ersten Reinigungselements mit dem genannten Kopf, und einem zweiten, am Kopf (42) befestigten Reinigungselement (76), dadurch gekennzeichnet, daß das Mittel zur lösbaren Verbindung des Kopfes (42) mit dem Handgriff (12) enthält: eine Lippe (51), die von einer Innenfläche des hinteren Endes des Durchganges (48) durch

den Kopf (42) radial nach innen vorspringt, ine Nut (24) in dem genannten einen Ende des Handgriffes (12), in die die Lippe (51) federnd eingreift, und einen Ring (32), der in längsaxialer Richtung auf einer Außenfläche des genannten hinteren Endes des Kopfes (42) verschiebbar ist, wobei der Ring (32), eine Nut (36) aufweist, die für den federnden Eingriff einer radial vorspringenden Rippe (53) auf der Außenfläche des hinteren Endes des Kopfes (42) geeignet ist, und eine Schulter (38) enthält, die zum Anschlag an eine ringförmige Lippe (26) auf dem genannten Handgriff vorgesehen ist.

2. Reinigungsstab nach Anspruch 1, dadurch gekennzeichnet, daß das genannte Mittel zur lösbaren Verbindung des ersten Reinigungselements (74) mit dem Kopf (42) ein flexibles Band (78) enthält, mit dem das erste Reinigungselement an einen Halter (62) anfügbar ist, welcher Halter (62) einen ersten Widerhaken (64) zum Eingriff in eine erste Ausnehmung (58) im genannten Kopf und einen zweiten Widerhaken (66) zum Eingriff in eine zweite Ausnehmung (60) im genannten Kopf aufweist.

3. Reinigungsstab nach Anspruch 2, dadurch gekennzeichnet, daß das flexible Band (78) ein erstes, T-förmiges Ende (80) und ein zweites Ende aufweist, wobei das erste, T-förmige Ende (80) von einer ersten Ausnehmung (72) in dem Halter (62) aufnehmbar ist und mit ersten Rippen (86) innerhalb des Halters einen Festsitz bildet, und das zweite Ende einen Vorsprung (84) aufweist, der innerhalb einer zweiten Ausnehmung (70) zwischen innerhalb des genannten Halters angeordneten Rippen (88) einen Festsitz bildet.

4. Reinigungsstab nach Anspruch 1, 2 oder 3, dadurch gekennzeichnet, daß das erste Reinigungselement (74) ein die Form eines Schwabbels (swab) aufweisendes Bündel aus Polypropylenfasern und das zweite Reinigungselement (76) ein ungewebtes Faserkissen ist.

5. Reinigungsstab nach einem der vorgenannten Ansprüche, dadurch gekennzeichnet, daß das eine Ende des Handgriffes (12) einen Längskeil (22) enthält, der von einem sich in axialer Richtung durch die Wand des genannteen Durchgangs (48) erstreckenden Schlitz (50a) aufgenommen wird.

Revendications

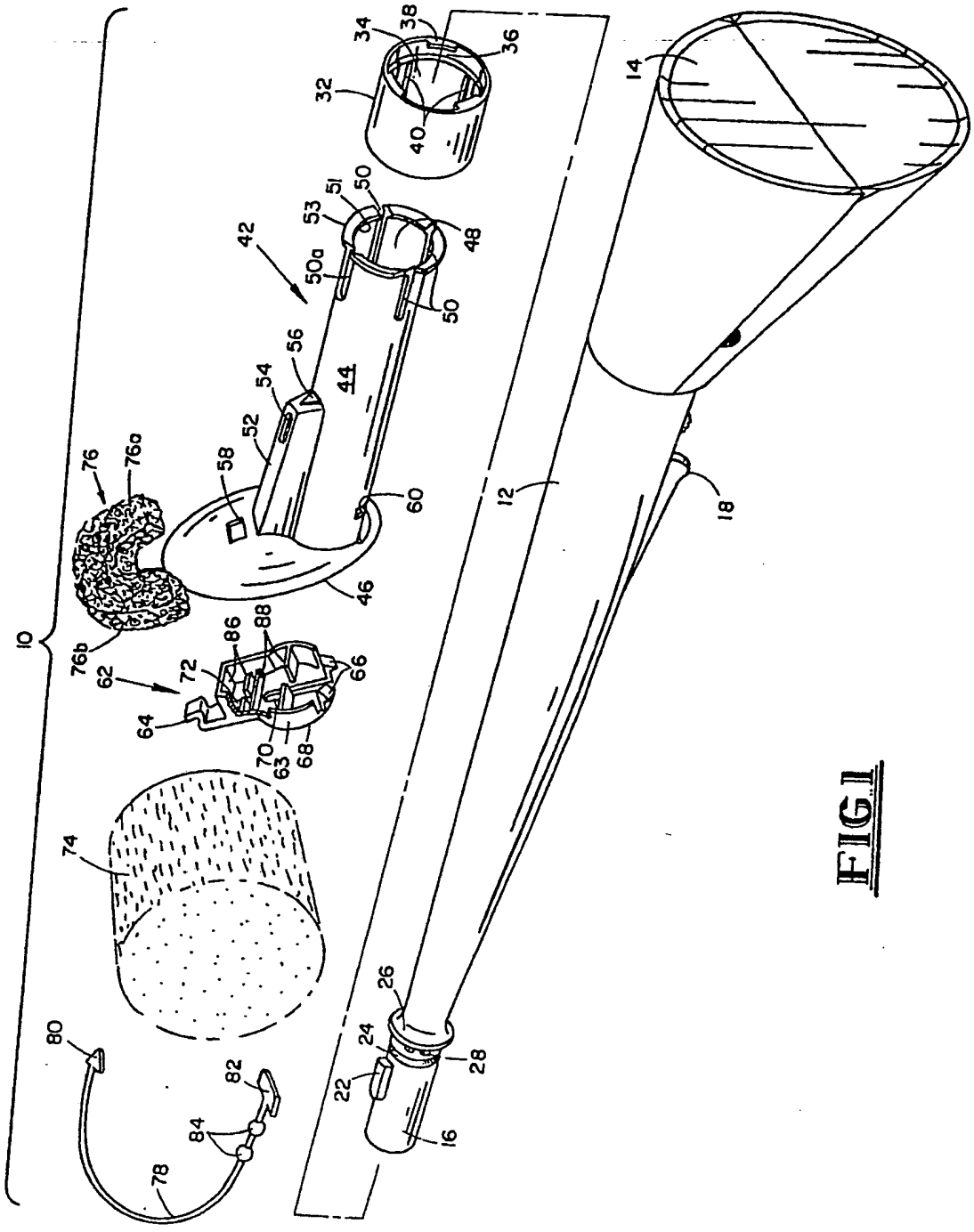
1. Balai de nettoyage comprenant: un manche (12), une tête (42) ayant un passage (48) pour loger une xtrémit´ (16) du manche, des moy ns (32, 44) pour fixer de façon amovible cett tête sur ce manche, un premier élément d nettoyage (74), des moyens (62, 78) pour fixer de façon amovible le premier élément de nettoyage sur la tête, et un deuxième élément de nettoyage (76) fixé sur cette tête (42), caractérisé en ce que les moyens pour fixer de façon amovible la tête (42) sur le manche (12) comportent un bec (51) se projetant radialement vers l'intérieur depuis une surface intérieure d'une extrémité arrière du passage (48) à travers la tête, une gorge (24) dans cette extrémité du manche pour coopérer de façon élastique avec ce bec, et un collier (32) pouvant glisser axialement sur la surface extérieure de l'extrémité arrière de la tête, ce collier (32) ayant une gorge (36) adaptée pour coopérer élastiquement avec une nervure radiale en relief (53) sur la surface extérieure au niveau de l'extrémité arrière de la tête, ce collier comprenant en outre un épaulement (38) pour venir buter contre une collerette annulaire (26) sur le manche.

2. Balai de nettoyage selon la revendication 1, dans lequel les moyens pour fixer de façon amovible le premier élément de nettoyage (74) sur la tête (42) comportent une sangle flexible (78) pour fixer ce premier élément de nettoyage sur un support (62), ce support ayant un premier crochet (64) pour coopérer avec une première encoche (58) dans la tête et un deuxième crochet (66) pour coopérer avec une deuxième encoche (60) dans la tête.

3. Balai de nettoyage selon la revendication 2, dans lequel la sangle flexible (78) a une première extrémité en forme de T (80) logée dans une première rainure (72) dans le support (62) en coopérant à force avec des premières nervures (86) dans ce support, et une deuxième extrémité avec une protubérance (84) pour se loger de force dans une deuxième rainure (70) entre des nervures (88) dans ce support.

4. Balai de nettoyage selon l'une des revendications 1, 2 ou 3, dans lequel le premier élément de nettoyage (74) est un faisceau de fibres de polypropylène ayant la forme dune serpillière et le deuxième élément de nettoyage (76) est un tampon de fibres non tissées.

5. Balai de nettoyage selon l'une des revendications précédentes, dans lequel une extrémité de la poignée (12) comporte une clavette (22) logée dans une fente (50a) s'étendant axialement à travers la paroi du passage (48).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50a
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58
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66
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70
72
74
76
76a
76b
78
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86
88

FIG 1

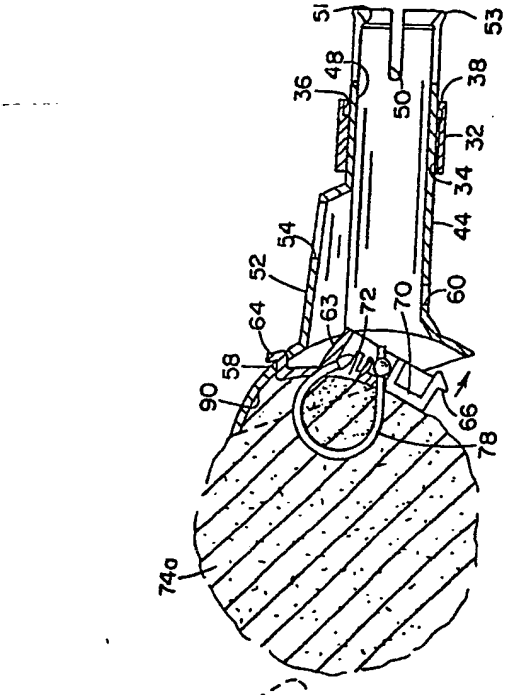

FIG. 2C

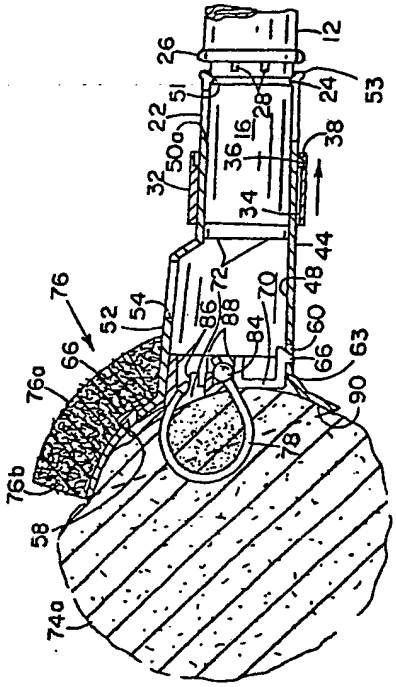

FIG. 2E

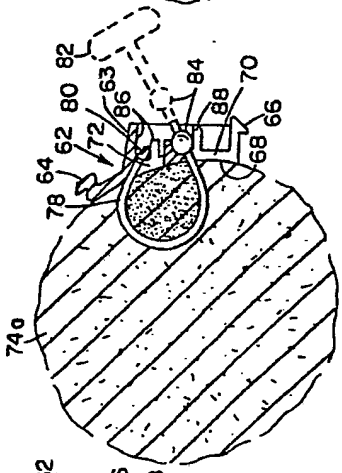

FIG. 2B

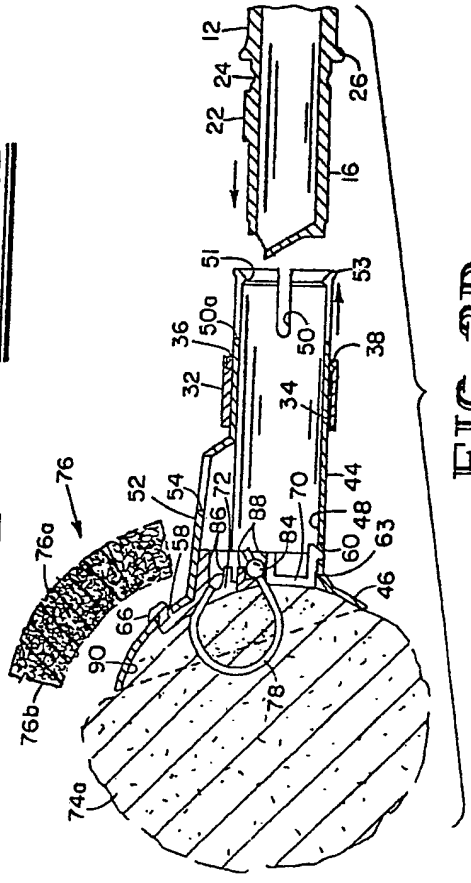

FIG. 2D

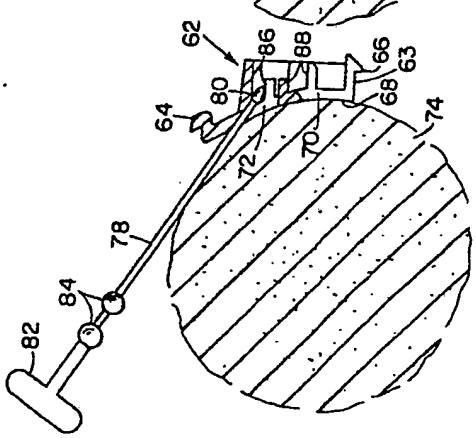

FIG. 2A

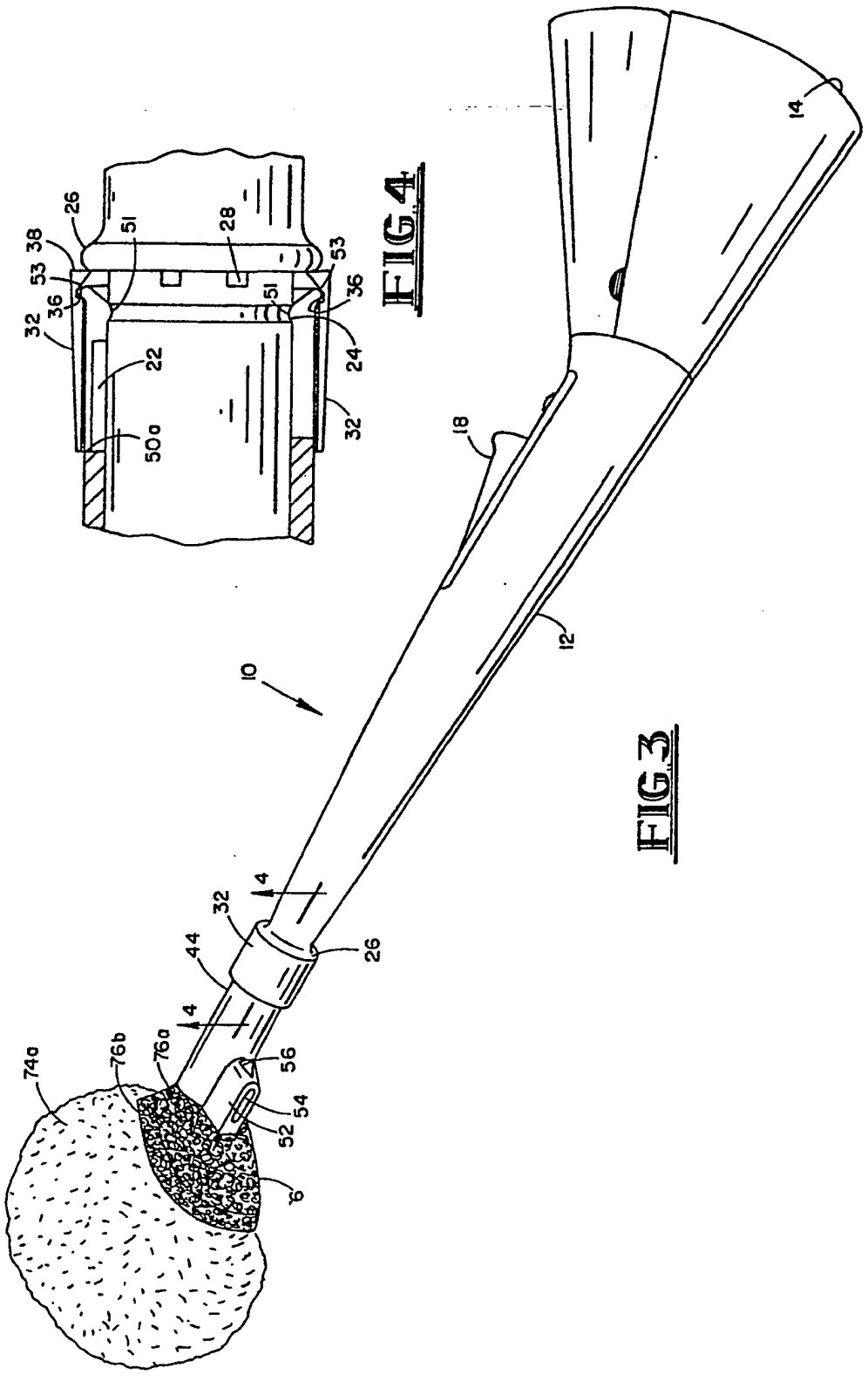
14
18
12
10
32
4
44
26
4
74a
76b
76a
56
54
52
16

FIG 3

26
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36
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53
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24
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50a
32

FIG 4

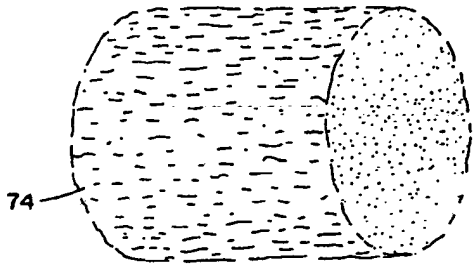

FIG. 5A

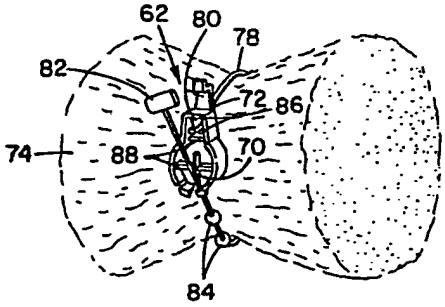

FIG. 5B

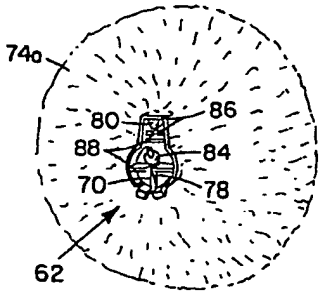

FIG. 5C